

CHAPTER 12

MONITORING AND CONTROL SYSTEMS

To manage onsite wastewater treatment systems properly, monitoring of process operation and performance is necessary. Because of the increasing number and complexity of onsite wastewater treatment systems, automated monitoring and control systems have become a key component to onsite treatment process management. System controls are necessary for controlling pumps, alarms, and other process equipment.

Most manufacturers of onsite wastewater treatment systems also provide basic control and alarm systems to alert the system owner of a malfunction. However, remote monitoring using telemetry systems is becoming a more feasible option for onsite applications. Telemetry is the science and technology of automatic measurement and transmission of data by wire, radio, or other means from remote sources to receiving stations for recording and analysis. The centralized management of onsite treatment systems is possible through the use of these automated monitoring and control devices.

The basic components of telemetry systems are described in this chapter. In addition to the systems listed below, most manufacturers of onsite treatment systems provide a control panel and alarm system specific for their system.

12-1 Sensors, alarms, and control devices

Sensors can be digital or analog type output devices. Sensors are used to make a measurement of a physical activity and provide a signal to a monitoring or control device. Float switches that are used for monitoring water levels are the most common digital sensors used in onsite treatment systems. Analog sensors can be used for measuring water level (using a pressure transducer), pump run time, sludge and scum depth, and constituent concentrations.

12-1.1 Conery Mfg., Inc.

1380 Enterprise Parkway
Ashland, OH 44805
Phone (419) 289-1444
Fax (419) 281-0366
E conmfg@bright.net
Web www.conerymfg.com
Description

Conery Mfg. provides a range of float switches and alarms for onsite wastewater treatment systems.



Figure 12-1

A typical float switch and alarm for high water notification and pump control. (Adapted from Conery, Mfg, Inc.)

12-1.2 Premier Tech Environment

7051 Meadow Lark Dr, Building 200, Suite 208
Birmingham AL 35242
Phone 877.295.5763
Fax 205.408.8783
Web www.premiertech.com
Model description

Control panels and float switches for monitoring liquid levels and pump control.



Figure 12-2

The Premier Tech control panel. (Adapted from Premier Tech Environment, Inc.)

12-1.3 Orenco Systems, Inc.

814 Airway Avenue

Sutherlin, OR 97479

Phone (541) 459-4449

Fax (541) 459-2884

Web www.orenco.com

Description

Orenco manufactures control systems for all types on onsite wastewater management systems.



Figure 12-3

An Orenco control panel for pump operation and float alarms. (Adapted from Orenco Systems, Inc.)

12-1.4 SEPTICwatch™

Worldstone, Inc.

376 Route 130; PO Box 660

Sandwich, MA 02563

Phone (508) 888-6161; (866) 279-2824

Fax (218) 847-4617

Web www.worldstoneinc.com

Description

The SEPTICwatch™ and GREASEwatch™ monitors provides continuous monitoring of the sludge, scum, temperature and liquid levels.



Figure 12-4

The SEPTICwatch from Worldstone Inc., provides continuous monitoring of sludge and scum levels in the septic tank for accurate determination of tank pumping intervals. (Adapted from Worldstone, Inc.)

12-1.5 SJE-Rhombus

22650 County Highway 6; PO Box 1708

Detroit Lakes, MN 56502

Phone (888) 342-5753; (218) 847-1317

Fax (218) 847-4617

E SJE@SJERHOMBUS.COM

Web www.sjerhombus.com

Description

A complete line of float switches, control panels, and alarms. Some control panels that interface with personal data assistants are also available.



Figure 12-5

The Data Minder control panel with PDA interface for downloading operational data. (Adapted from SJE Rhombus, Inc.)

12-2 Programmable Logic Controller (PLC)

A digital control device that receives input from system devices such as float switches and pumps. Programmable logic controllers also have output capability for controlling systems devices. For onsite wastewater treatment systems, PLCs are often used for controlling pump on and off time and can also perform advanced features, such as adjusting dosing frequency to remediate high and low water conditions.

12-2.1 Orenco Systems, Inc.

814 Airway Avenue
Sutherlin, OR 97479
Phone (541) 459-4449
Fax (541) 459-2884
Web www.orenco.com

Description

Orenco manufactures control systems for all types of onsite wastewater management systems.



Figure 12-6

A programmable logic controller manufactured by Orenco. (Adapted from Orenco Systems, Inc.)

12-2.2 Tesco Controls, Inc.

3434 52nd Avenue
Sacramento, CA 95823-9012
Phone (916) 395-8800
Fax (916) 429-2817
E sales@tescocontrols.com
Web www.tescocontrols.com

Description

Manufacturers PLCs for many water and wastewater applications.



Figure 12-7

One of the programmable logic controllers manufactured by Tesco for controlling pumps. (Adapted from Tesco Controls, Inc.)

12-3 Data loggers

Data loggers are devices used to measure and record data from an analog or digital sensor. Data loggers only record data measurements and do not transmit to remote locations. In most cases, data loggers are only able to process one type of signal, requiring additional units for more complex data input. The data is either recorded and printed on paper output or stored in a memory device and downloaded periodically. The remote monitoring systems discussed below incorporate data loggers.

12-3.1 Onset Computer

PO Box 3450
Pocasset, MA 02559-3450
Phone (800) 564-4377
Fax (508) 759-9100
E sales@onsetcomp.com
Web www.onsetcomp.com

Description

Products include a full range of data acquisition instrumentation, data loggers, and data transfer devices.

12-4 Auto dialer

The auto dialer is a relatively simple device that is programmed to call a number in the event of an alarm condition. These systems do not log or transmit data, except for the alarm condition notification. Auto dialers are useful for alerting a management organization of a high water alarm; however, more complex systems may be used to monitor multiple parameters.

12-4.1 Zabel Environmental Technology

PO Box 1520

Crestwood KY 40014

Phone (800) 221-5742

Fax (502) 992-8201

E zabel@zabelzone.com

Web www.zabelzone.com

Description

Float switches, control panels, alarms, and auto-dialers for onsite systems.



Figure 12-8

The Zabel alarm and auto dialer system. (Adapted from Zabel Environmental Technology, Inc.)

12-5 SCADA (Supervisory Control And Data Acquisition) systems

A basic SCADA system consists of a central computer that communicates with remote control points such as pumps and metering stations. At these control points, remote terminal units (RTUs) gather and manage data. The central computer is used to acquire data from the RTUs and provide control functions.

12-5.1 Bristol Babcock

1100 Buckingham Street

Watertown, CT 06795

Phone (800) 395-5497; (860) 945-2200

Fax (860) 945-2213

Web www.bristolbabcock.com

Description

Bristol Babcock supplies process control and measurement products, SCADA systems, transmitters, and services to the water and wastewater industry.

12-5.2 Industrial Control Links

12840 Earhart Avenue

Auburn, CA 95602

Phone 530-888-1800

Fax 530-888-7017

E icl@iclinks.com

Web www.iclinks.com

Description

Industrial Control Links, Inc. (ICL) designs and manufactures hardware and software solutions to collect, record, and transport information for SCADA systems, process control and industrial automation applications.



Figure 12-9

A wireless RTU from Industrial Control Links for remote process monitoring. (Adapted from Industrial Control Links, Inc.)

12-5.3 Quad Tech, LLC.

PO Box 907
 Norcross, GA 30091
 Phone (770) 932-0250
 Fax (770) 271-8361
 E mktg@quadtechllc.com
 Web www.quadtechllc.com

Description

Control panels and remote communications
 equipment and software for SCADA systems.

12-5-4 Tesco Controls, Inc.

3434 52nd Avenue
 Sacramento, CA 95823-9012
 Phone (916) 395-8800
 Fax (916) 429-2817
 E sales@tescocontrols.com
 Web www.tescocontrols.com

Description

Complete remote telemetry and SCADA systems
 for water and wastewater applications.

12-5.5 Zetron

PO Box 97004
 Redmond, WA 98073-9704
 Phone (425) 820-6363
 Fax (425) 820-7031
 E zetron@zetron.com
 Web www.zetron.com

Description

Complete remote telemetry and
 SCADA systems for water and
 wastewater applications.

12-6 Telemetry systems

Telemetry systems make remote data acquisition and control possible and greatly extend that range of options for management of onsite treatment systems. Data is acquired from system devices and sensors and transmitted by radio or modem to a specified location. Web based telemetry systems transmit data to a server, where the data is put into a database that is accessible from any computer with internet access capabilities. In addition, logic controllers can be used to diagnose and correct system problems before a failure occurs.

12-6.1 In-Situ, Inc.

210 S. Third Street
 Laramie, WY 82073-0920
 Phone (800) 446-7488; (307) 742-8213
 Fax (307) 721-7598
 Web www.in-situ.com

Description

Water quality sensors and wireless, solar
 powered telemetry systems.

12-6.2 TEI/US

P.O. Box 200122
Austin, TX, 78720-0122
Phone (512) 259-2977
Fax (512) 259-1979
E tew@teicontrols.com
Web www.teicontrols.com

Description

TEI Controls can provide control and monitoring systems for many onsite applications.



Figure 12-10

TEI Controls radio telemetry systems can transmit data by radio within a 14 mile range. (Adapted from TEI/US, Inc.)

12-6.3 Telog Instruments, Inc.

830 Canning Pkwy
Victor, NY 14564
Phone (716) 742-3000
Fax (716) 742-3006
E telogsales@telog.com
Web www.telog.com

Description

Data loggers, monitoring equipment, and telemetry systems.



Figure 12-11

A remote telemetry system by Telog. (Adapted from Telog Instruments, Inc.)

12-6.4 VeriComm® by Orenco Systems, Inc.

814 Airway Avenue
Sutherlin, OR 97479
Phone (541) 459-4449
Fax (541) 459-2884
Web www.orenco.com

Description

Orenco manufactures control systems for all types on onsite wastewater management systems. The VeriComm control panel utilizes web-based communication of system operation data and online control.



Figure 12-12

The Vericomm control panel. (Adapted from Orenco Systems, Inc.)